

# R&D FACILITY facts

DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY  
FEDERAL ENERGY TECHNOLOGY CENTER

**GAS STREAM** cleanup  
PROJECT

## ADVANCED POLLUTION CONTROL RESEARCH AT FETC'S COMBUSTION TEST FACILITY

### CONTACT POINTS

#### TECHNICAL:

**Richard Hargis\***  
Chemical Engineer  
Office: (412) 892-6065  
E-Mail: hargis@fetc.doe.gov

#### ADMINISTRATIVE:

**R. Diane Manilla\*\***  
Technology Transfer  
Program Manager  
Office: (304) 285-4086  
E-Mail: rmanil@fetc.doe.gov

**David Wildman\***  
Senior Management  
Technical Advisor  
Office: (412) 892-4913  
E-Mail: wildman@fetc.doe.gov

#### MAIL ADDRESS:

\* U.S. Department of Energy  
P.O. Box 10940  
626 Cochran's Mill Road  
Pittsburgh, PA 15236-0940

\*\* U.S. Department of Energy  
P.O. Box 880  
3610 Collins Ferry Rd.  
Morgantown, WV 26507-0880

### Capabilities

America's coal resources are far greater than the entire world's supply of oil, but burning coal to generate energy produces emissions that must be controlled. It is in the Nation's interest to maximize the use of this plentiful resource while minimizing its impact on the environment. The Department of Energy's Advanced Power Systems program seeks to address this goal by focusing on flue gas cleanup technologies that can obtain extremely high levels of emissions control. By improving the state of the art in pollutant removal from flue gas, power producers can reduce the environmental effects of generating electricity and minimize the impact on consumer costs.

DOE's field center in Pittsburgh has various pilot-scale combustion and flue-gas-cleanup research facilities, the largest of which is a 500 lb/hr coal combustor complete with ductwork, spray dryer, and auxiliary equipment. DOE has used this unit in the past to investigate low-NO<sub>x</sub> combustion, dry regenerable sorbent processes, spray drying, and duct injection techniques. Current efforts are directed at characterization and control of air toxics.

The combustor is a wall-fired, dry-bottom furnace that burns pulverized coal at a rate up to 500 pounds per hour, or about 6 million Btu/hr. The combustor is large enough to enable realistic evaluations of engineering variables affecting pollutant removals and still small enough to operate economically.

Like full-scale units, this test unit features multiple wall-fired burners and an integrated secondary air preheater. These important similarities allow researchers greater confidence in applying data from this unit to full-scale units. Typically, the test unit operates on coal 12 hours a day for 4 to 5 days of each test week. When the unit is not firing coal, natural gas is burned to maintain the furnace in standby condition.

### Opportunities

Initial air toxics characterization testing has been completed and the 500 lb/hr combustion unit is now available to:

- Advance state-of-the-art sampling techniques for the measurement of air toxics, e.g., mercury speciation.
- Develop the capabilities of continuous air toxics emissions monitoring systems for on-line characterization of stack emissions.
- Investigate innovative control technologies with higher removal efficiencies than currently exist.
- Perform cooperative undertakings with industry.



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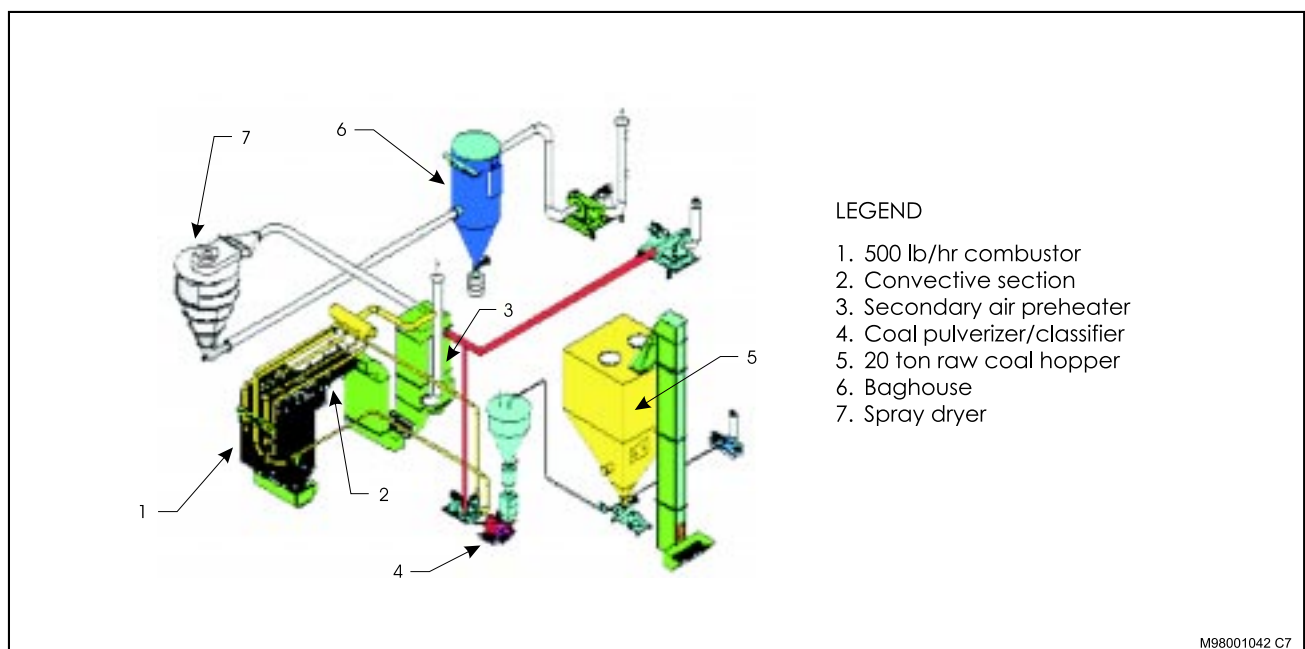


A View of the Combustor



Researchers Preparing to Sample Emissions

Flow Diagram of the System



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